

**National Transportation Safety Board
Washington, DC 20594**

Brief of Accident

Adopted 08/05/1993

DCA91MA021 File No. 153	02/17/1991	CLEVELAND, OH	Aircraft Reg No. N565PC	Time (Local): 00:19 EST		
Make/Model:	MCDONNELL DOUGLAS / DC-9-15			Fatal	Serious	Minor/None
Engine Make/Model:	P&W / JT8D-7B		Crew	2	0	0
Aircraft Damage:	Destroyed		Pass	0	0	0
Number of Engines:	2					
Operating Certificate(s):	Flag Carrier/Domestic					
Name of Carrier:	RYAN INTERNATIONAL AIRLINES					
Type of Flight Operation:	Scheduled; Domestic; Cargo					
Reg. Flight Conducted Under:	Part 121: Air Carrier					
Last Depart. Point:	Same as Accident/Incident Location			Condition of Light:	Night/Dark	
Destination:	INDIANAPOLIS , IN			Weather Info Src:	Weather Observation Facility	
Airport Proximity:	On Airport			Basic Weather:	Instrument Conditions	
Airport Name:	CLEVELAND-HOPKINS INT'L			Lowest Ceiling:	1500 Ft. AGL, Obscured	
Runway Identification:	23L			Visibility:	1.00 SM	
Runway Length/Width (Ft):	8998 / 150			Wind Dir/Speed:	220 / 014 Kts	
Runway Surface:	Asphalt			Temperature (°C):	-5	
Runway Surface Condition:	Wet			Precip/Obscuration:	Snow / None	
Pilot-in-Command	Age: 46			Flight Time (Hours)		
Certificate(s)/Rating(s)				Total All Aircraft:	10505	
Airline Transport; Multi-engine Land; Single-engine Land;				Last 90 Days:	Unk/Nr	
Instrument Ratings				Total Make/Model:	505	
Airplane				Total Instrument Time:	UnK/Nr	

THE FLIGHT HAD FLOWN THROUGH WEATHER CONDUCTIVE TO AIRFRAME ICE ABOUT 40 MIN PRIOR TO THE ACCIDENT DURING DESCENT INTO CLEVELAND. DURING THE 35-MINUTE TURNAROUND AT CLEVELAND THE CREW DID NOT EXIT THE AIRPLANE TO CONDUCT AN EXTERIOR PREFLIGHT INSPECTION TO VERIFY THAT THE WINGS WERE FREE OF ICE CONTAMINATION. IT WAS SNOWING WHILE THEY WERE ON THE GROUND. THE AIRPLANE STALLED AND ROLLED INTO THE GROUND IMMEDIATELY AFTER TAKEOFF. THERE WAS NO OPERATOR REQUIREMENT FOR THE PREFLIGHT. THE FLIGHT HAD NOT BEEN GIVEN TRAINING REGARDING THE EFFECTS OF WING CONTAMINATION ON THE AIRPLANE. THE FAA AND THE MANUFACTURER HAVE BEEN AWARE FOR SEVERAL YEARS OF THE PROPENSITY OF THE DC-9 SERIES 10 TO THE LOSS OF CONTROL CAUSED BY WING CONTAMINATION, BUT NEITHER OF THEM TOOK POSITIVE ACTION TO INCLUDE RELATED INFORMATION IN THE APPROVED AIRPLANE FLIGHT MANUAL.

Brief of Accident (Continued)

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Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) WEATHER CONDITION - SNOW
2. (C) WING - ICE
3. (C) AIRCRAFT PREFLIGHT - NOT PERFORMED - PILOT IN COMMAND
4. (C) ICE/FROST REMOVAL FROM AIRCRAFT - NOT PERFORMED - PILOT IN COMMAND
5. (C) INADEQUATE TRAINING - COMPANY/OPERATOR MANAGEMENT
6. (C) ACFT/EQUIP,INADEQUATE AIRCRAFT MANUALS - MANUFACTURER
7. (C) ACFT/EQUIP,INADEQUATE AIRCRAFT MANUALS - FAA(OTHER/ORGANIZATION)
8. STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings Legend: (C) = Cause, (F) = Factor

The National Transportation Safety Board determines the probable cause(s) of this accident as follows.

THE FAILURE OF THE FLIGHTCREW TO DETECT AND REMOVE ICE CONTAMINATION ON THE AIRPLANE'S WINGS, WHICH WAS LARGELY A RESULT OF A LACK OF APPROPRIATE RESPONSE BY THE FEDERAL AVIATION ADMINISTRATION, DOUGLAS AIRCRAFT COMPANY, AND RYAN INTERNATIONAL AIRLINES TO THE KNOWN CRITICAL EFFECT THAT A MINUTE AMOUNT OF CONTAMINATION HAS ON THE STALL CHARACTERISTICS OF THE DC-9 SERIES 10 AIRPLANE. THE ICE CONTAMINATION LED TO WING STALL AND LOSS OF CONTROL DURING THE ATTEMPTED TAKEOFF. (NTSB REPORT AAR-91/09)